

IN THE CLAIMS:

1. (CURRENTLY AMENDED) A device for measuring simultaneously the phase at each point of an image formed by light reflected from a sample, in which the phase has been modified by plasma resonance in a thin conducting layer which is close to, or in contact with, the sample whose image is being recorded, the device comprising:

a thick transparent substrate with a planar surface on which a thin layer of conducting material is deposited, onto which is placed the sample being investigated, either in contact with the thin layer of conducting material or a short distance from the layer;

a light source linearly polarized in a predetermined direction, whose light beam is reflected from said thin layer of conducting material from the side opposite to that on which the sample is placed at an angle substantially equal to that at which the interaction with the plasma resonance is maximized, the evanescent light field on the far side of the conducting film interacting with the sample, thus modifying the reflected light;

an a Linnik interferometer which enables the reflected beam to be compared interferometrically with a reference beam derived from the same source, but not having had any interaction with the sample;

an imaging means for recording an image of the planar surface in interference with the reference beam, and digitizing the recorded image; and

a processing means for processing said digitized image to provide an output image, wherein the light beam is illuminated annularly, with appropriate radial polarization, so as to illuminate the sample isotropically at an angle substantially equal to that at which the interaction with the plasma resonance is maximized.

Claims 2 to 13 (CANCELLED).

14. (PREVIOUSLY PRESENTED) A device for measuring simultaneously the phase at each point of an image formed by light reflected from a sample, in which the phase has been modified by plasma resonance in a thin conducting layer which is close to, or in contact with, the sample whose image is being recorded, the device comprising:

a thick transparent substrate with a planar surface on which a thin layer of conducting material is deposited, onto which is placed the sample being investigated, either in contact with the thin layer of conducting material or a short distance from the layer;

a light source linearly polarized in a predetermined direction, whose light beam is reflected from said thin layer of conducting material from the side opposite to that at which the sample is placed at an angle substantially equal to that at which the interaction with the plasma resonance is maximized, the evanescent light field on the far side of the conducting film interacting with the sample, thus modifying the reflected light;

an interferometer which enables the reflected beam to be compared interferometrically with a reference beam derived from the same source, but not having had any interaction with the sample;

an imaging means for recording an image of the planar surface in interference with the reference beam, and digitizing the recorded image; and

a processing means for processing said digitized image to provide an output image,

wherein the light beam is illuminated annularly, with appropriate radial polarization, so as to illuminate the sample isotropically at an angle substantially equal to that at which the interaction with the plasma resonance is maximized.